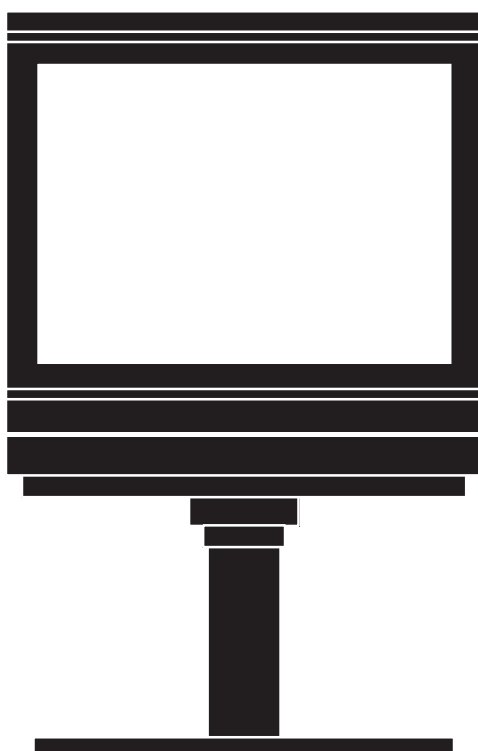


BeoVision MX 8000

Type 910x

On-site service guide

English, German, French, Italian, Spanish, Danish, Dutch



*This On-site service guide must be
returned with the defective parts/
back-up suitcase !*

1.1	Contents
2.1	English
3.1	Deutsch
4.1	Français
5.1	Italiano
6.1	Español
7.1	Dansk
8.1	Nederlands
9.1	Service mode & Main chassis in service position
10.1	Illustrations
11.1	Replacement of main chassis
12.1	Replacement of other modules
13.1	Survey of modules

*There is no Brief operation guide in this On-site service guide.
Instead an english version of the user guide is enclosed the
back-up suitcase.*

#1	Introduction
#2	Repair of BeoVision MX 8000
#3	Fault flow chart
#4	Removal of the cloth front
#5	Removal of the contrast screen and cleaning the television
#6	Adjustments after replacement of main chassis
#7	Check after replacement of main chassis or modules
#8	Service Mode and Flash-programming
9.1	Service mode
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13.1	Survey of modules

Survey of symbols:



Make a shortcircuit between the marked points, usually for discharging e.g. a picture tube



Push with finger, in arrow direction



Disconnect internal plug



Connect internal plug



Disconnect mains plug



Connect mains plug



Disconnect aerial or other external plug



Connect aerial or other external plug



Loosen/remove or fasten/install screw



Dashed arrow. Push/pull e.g. PCB, chassis etc. in arrow's direction



Filled arrow. Refer to page/chapter for more information, e.g. 12.4 PCB51, if mounted:

Turn to 12.4 PCB51 and remove or install PCB if such is mounted



STATIC ELECTRICITY
MAY DESTROY THE
PRODUCT

Warning

Static electricity may destroy the product!

A static-protective field service kit must always be used when replacement of the modules takes place. Follow the instructions in the guide and use the ESD mat area for both the new and old modules.

Please note:

When mains voltage on the TV is required, remove the connection from the TV to the ESD mat.

#1 Introduction

This On-site service guide explains how to service the BeoVision MX 8000 by replacing the modules. In the following you will find repair tips, description of how to replace the different parts and a description of how to adjust after servicing.

When the following symbol occurs; ➤ it is a cross-reference to a photo or an illustration in the back of this On-site service guide.

The chapters in the On-site service guide are named for example *#2 Repair of BeoVision MX 8000*. They are listed numerically.

Please note:

This On-Site Service guide must always be returned with the defective parts.

#2 Repair of BeoVision MX 8000

Before troubleshooting is initiated, let the customer explain and demonstrate the fault, if possible.

Afterwards, check:

- that all cables are plugged in correctly
- that the mains voltage is connected, and switched on
- that an aerial signal is connected
- that all external sources such as VTR, DVD etc. are connected correctly and switched on. Use the enclosed IR-blaster if necessary in order to check IR-signals to the external sources.

When troubleshooting is initiated, please refer to *#3 Fault flow chart*. The fault should fit into one of the 4 main groups.

- System functionality
- Camcorder
- Picture
- Sound

Follow the arrows from each box, answering *YES* or *NO*, to locate the fault. The back cover may have to be removed and the main chassis placed in service position. See *9.1 Serviceposition 1* and *9.3 Main chassis in service position* for further information.

If measurements are needed, please refer to the chapter measurements, placed behind *#3 Fault flow chart*.

When a voltage specification is given in the fault flow chart, a value within $\pm 10\text{--}20\%$ of this is OK.

When replacing a module, remember to disconnect the mains voltage. Carry out the replacement, and reconnect the mains voltage. Then check if the fault is rectified.

When replacing the main chassis remember to transfer optional modules, such as Modulator etc. to the new main chassis. Please do also remember carefully remove the EEPROM 61C6 (by using IC-pliers (3629145)) from the defective chassis and place it in the new chassis.

An extra help in troubleshooting is reading out the error codes. Please refer to *#8 Survey of Error Codes* for further information.

After repair of BeoVision MX 8000, always remember to follow *#6 Adjustments after replacement of main chassis* and/or *#7 Check after replacement of main chassis or modules*.

Important note concerning theft protection, if activated:

Before servicing the product, please ask the customer to deactivate the theft protection, if possible.

- If the theft protection is active during service, please note that exchanged modules must always be returned to Bang & Olufsen for service. The exchanged modules will immediately, after mains on, be registered to this product and this registration can only be changed at Bang & Olufsen, Struer DK.
- If the back-up suitcase is not being returned to Bang & Olufsen after use, but refilled by e.g. the dealer or workshop with new modules, please read the following instruction.

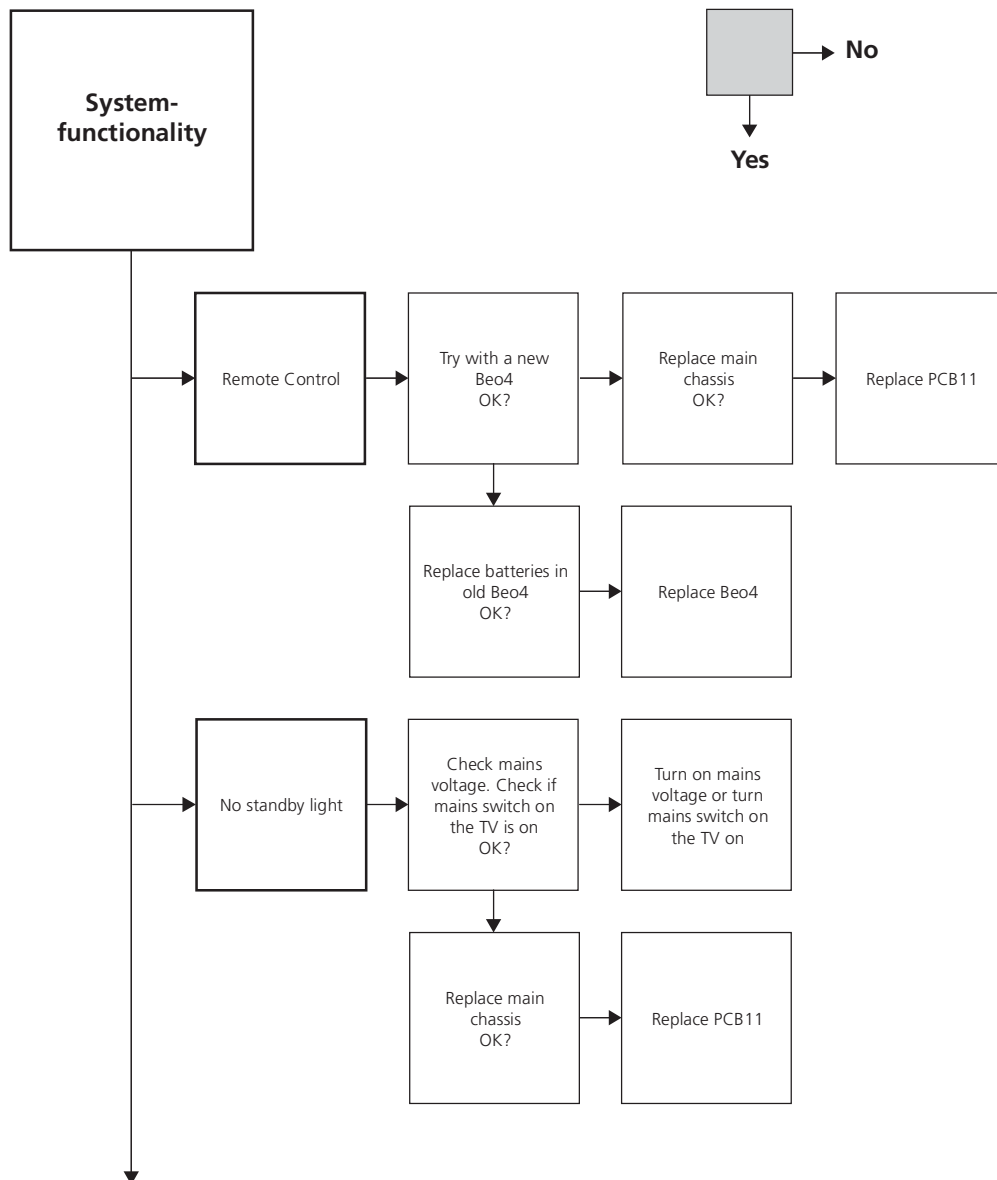
When exchanging modules to see whether they are defective or not, it is important to use the Service code, to avoid registration of the modules for this specific product.

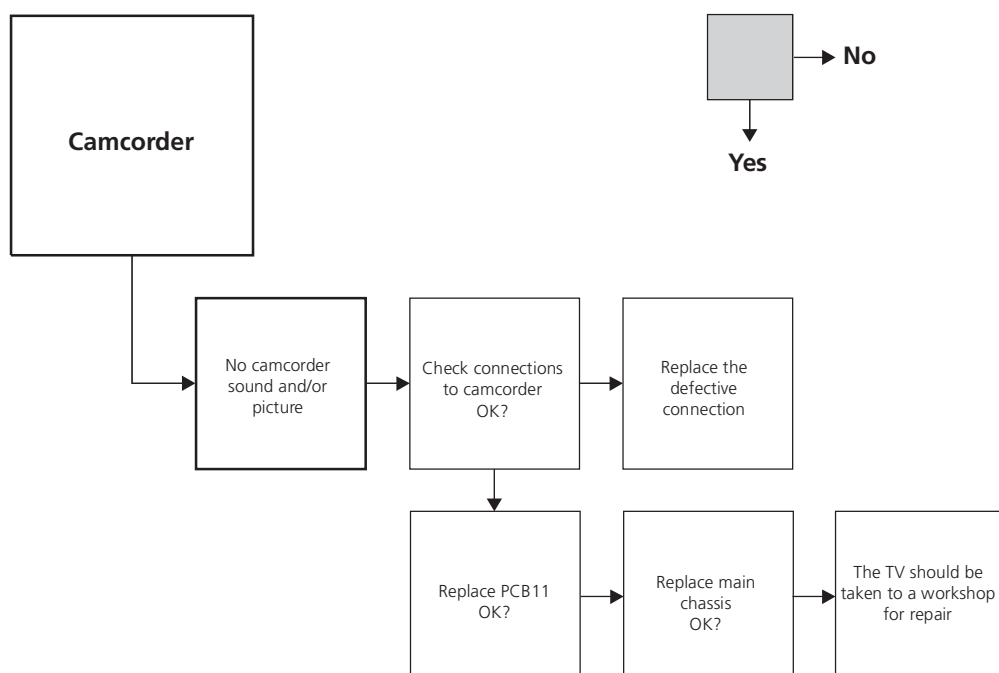
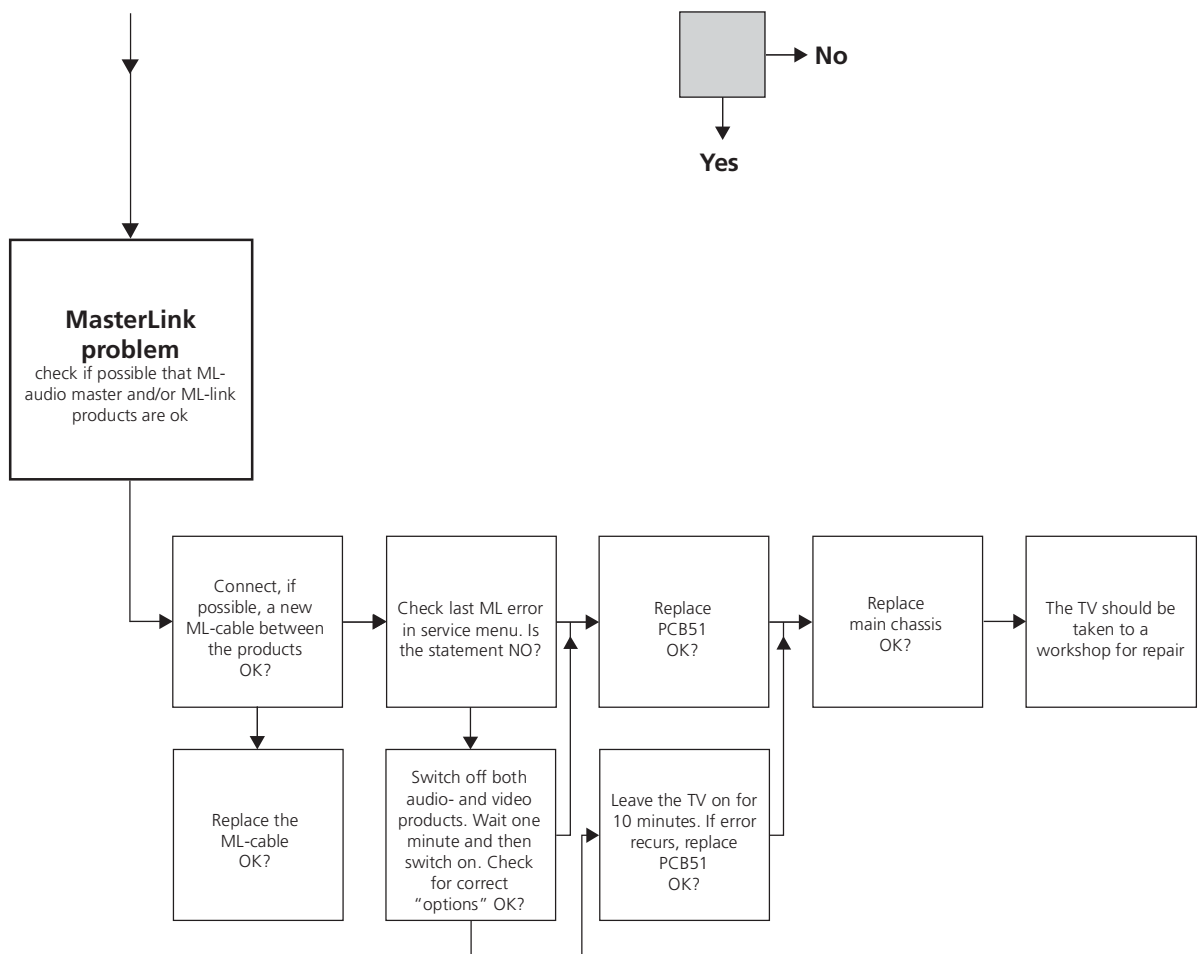
When the TV is turned on, use Service code, pressing ◀ for 3 seconds.

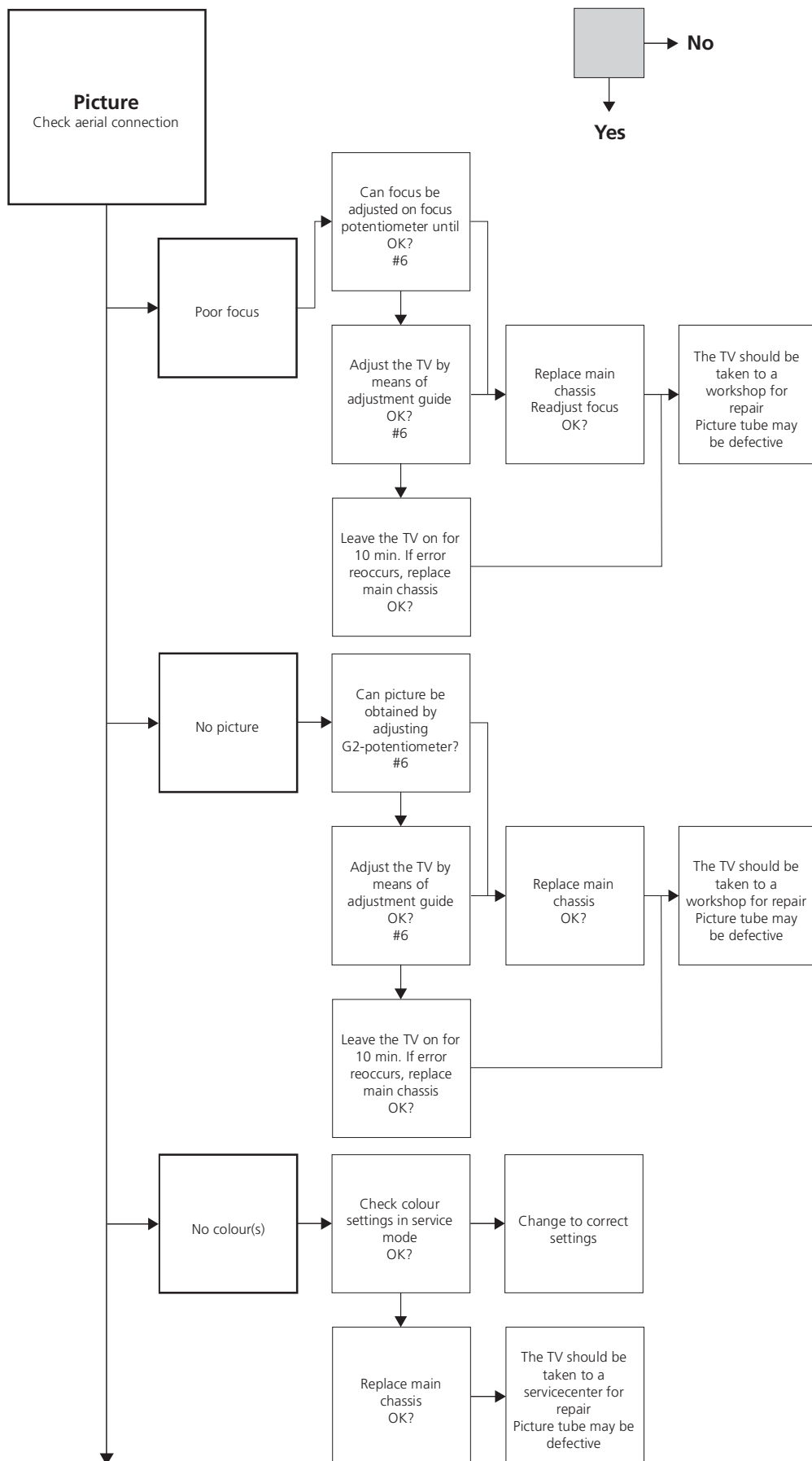
A Mastercode menu appears, and the Service code, which is 11111, must be entered.

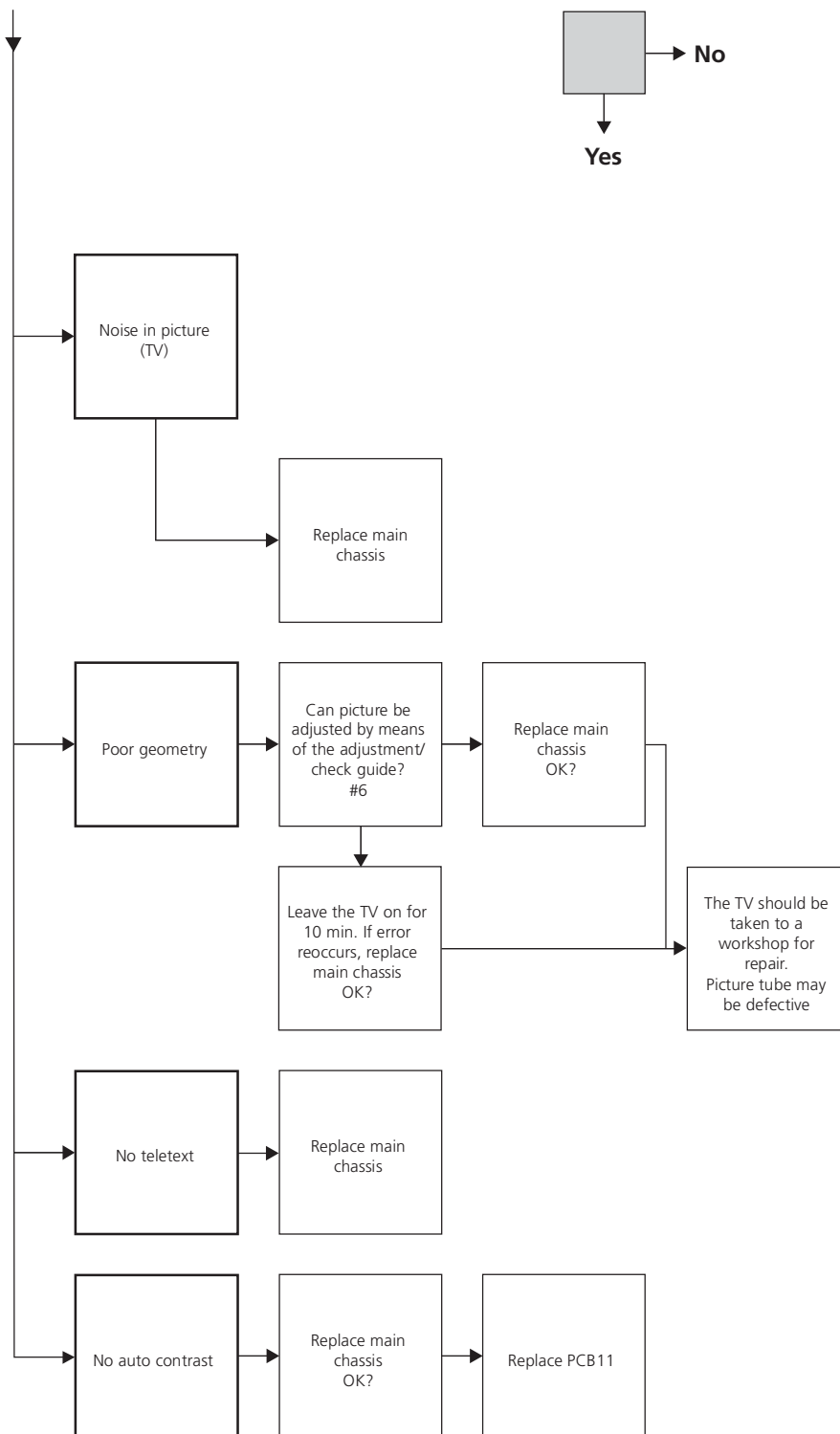
It is then possible to exchange modules to see whether they are defective or not. If not, the registration of the module will not take place until for 12 hours, time enough to replace with the old module again.

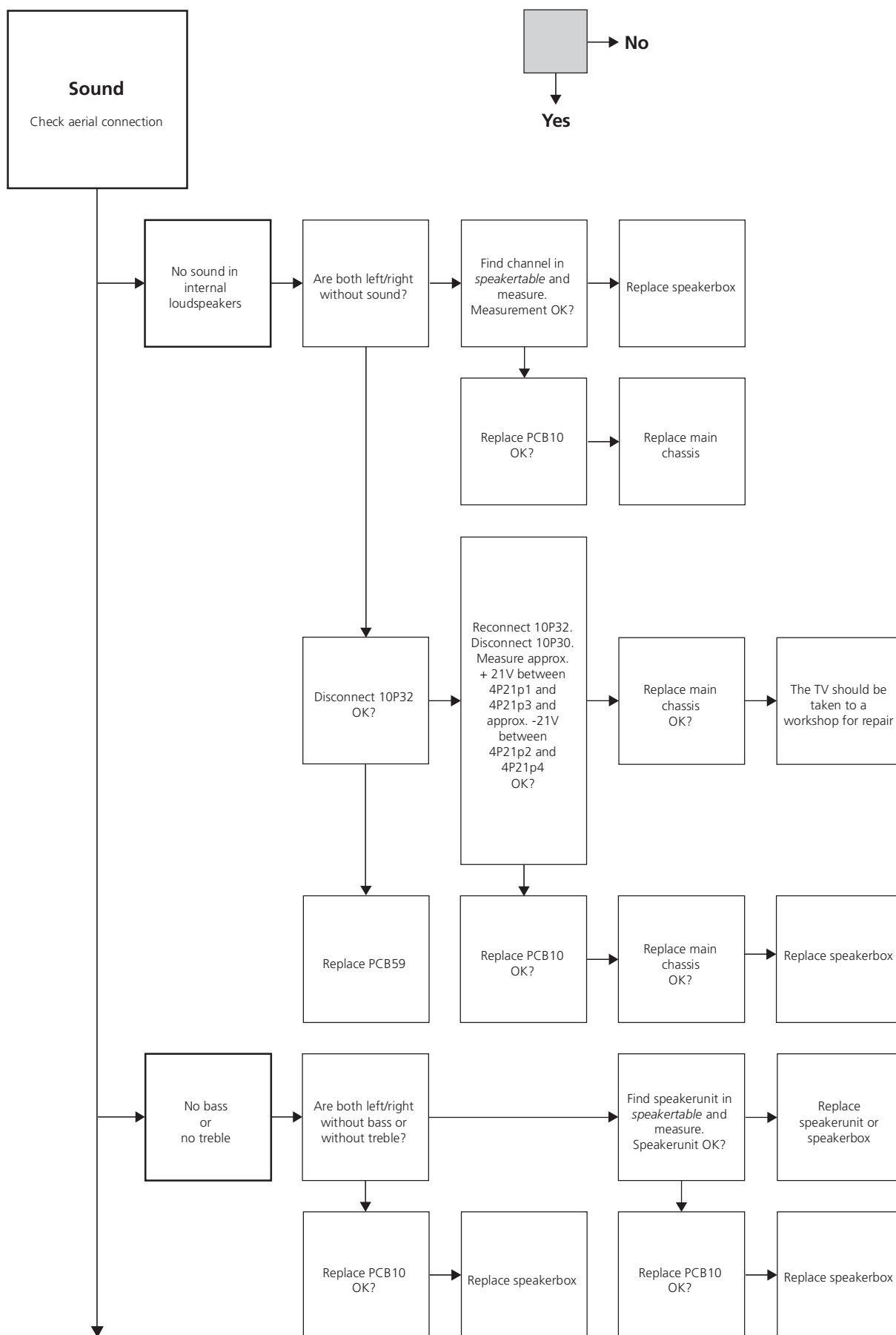
#3 Fault flow chart

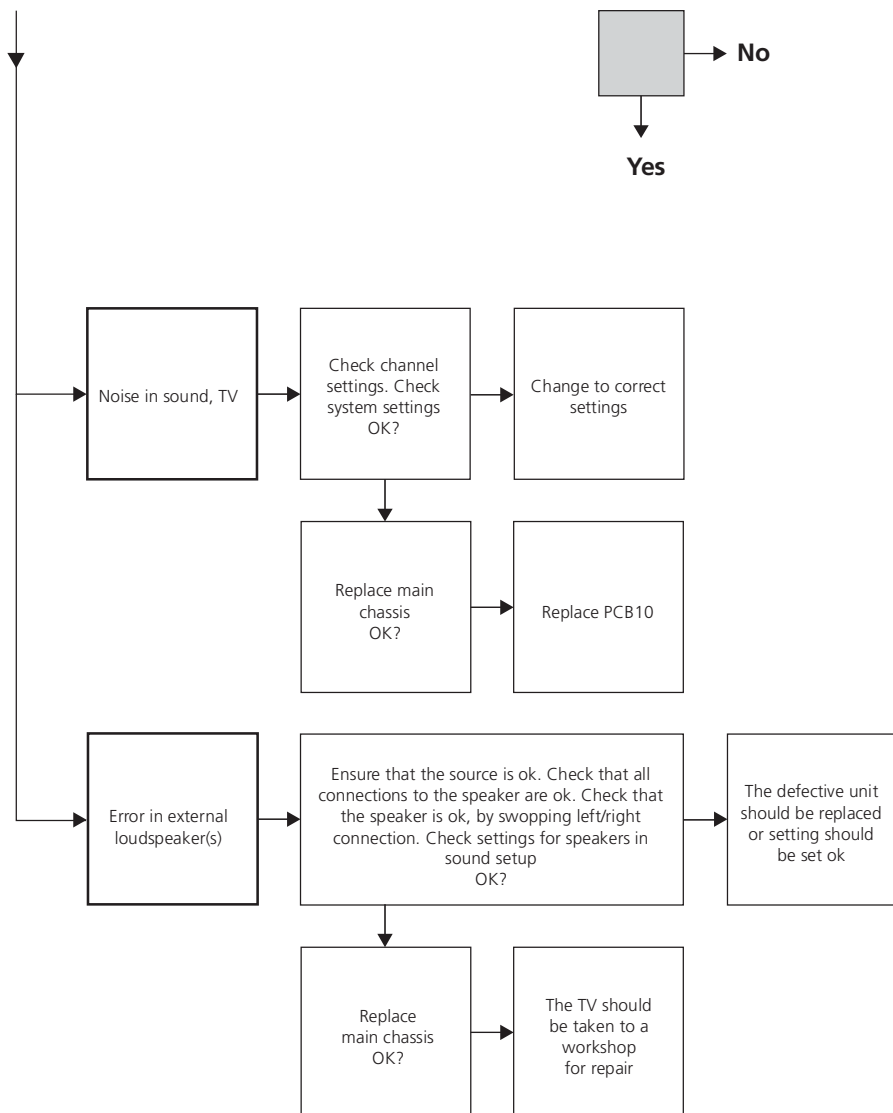






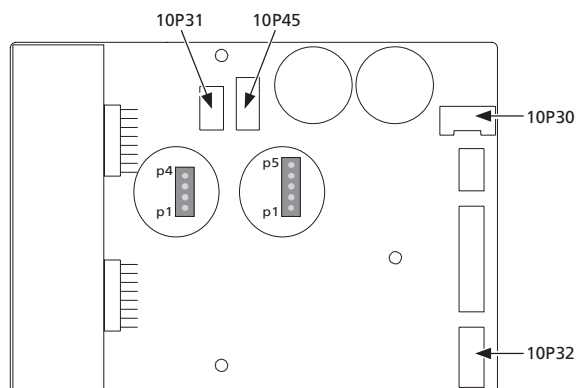
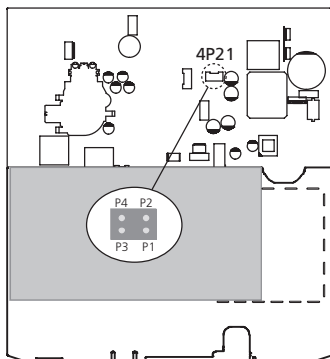






Placement of measuring points, described in the fault flow chart

4P21



These tables are used in connection with fault-finding on BeoVision MX 8000

No bass or no treble

- Find the channel and symptom in the table and measure on the pins described, with multimeter in ohm's position. Resistance should be about 0 to 3 ohms. If not the speakerunit should be replaced by a new one.

Channel	Bass or Treble		Pin no.
Left	Bass	10P45	4 - 2
Left	Treble	10P45	5 - 3
Right	Bass	10P31	3 - 1
Right	Treble	10P31	4 - 2

No sound

- Find the channel and measure on the pins described, with multimeter in ohm's position. Resistance should be approx. 0 ohm. If not the speaker box should be replaced.

Channel		Pin no.
Left	10P45	4 - 2
Right	10P31	3 - 1

#4 Removal of the cloth front**Remove the cloth front**

- Use the white gloves to avoid smudging the cloth front. Remove the cloth front by carefully pulling out at each corner and at the same time pull it downwards (see ➤1).

Mount the cloth front

- Use the white gloves to avoid smudging the cloth front. Reinstall the cloth front, by holding it at the corners, and then push it towards the TV and upwards. You can easily feel if the cloth front is not in the right place.

#5 Removal of the contrast screen and cleaning the television**Remove the contrast screen**

- Use the white gloves to avoid smudging the contrast screen. See ➤2.

Clean the picture tube and the contrast screen

- To clean the picture tube and the contrast screen use a mild window cleaning fluid. Make sure no streaks or traces of the cleaning fluid are left on the screen.

Clean the product

- Wipe dust of the surfaces of the television using a dry, soft cloth. If necessary, remove grease stains or more persistent dirt with a firmly wrung lint-free cloth which you have dipped in a solution of water containing a few drops of a mild detergent.

#6 Adjustments after replacement of main chassis

Disconnect the ESD mat from the main chassis

- Remove the alligator clip from the aerial input on the main chassis.

Connect the mains voltage

Turn on the TV

Set settings for VTR

- A VTR must be used for adjustment to take place.
- If the customer has a video tape recorder (VTR), then this can be used. If not, another VTR has to be used. If the customer does not have a VTR: Select OPTIONS in SETUP. Select CONNECTIONS. Set V.TAPE to V.TAPE. Remember to set V.TAPE to NONE, when adjustment of the TV is finished, (not if the customer's VTR has been used).

Access to Service Mode

Select a SETUP menu.

Beo4: Press **0 0 GO** within 3 seconds.

Select ordinary menu operation to leave Service Mode.

Operation in Service Mode.

Beo4	Activity
EXIT	Removes the menus
GO	- Selects the sub menu to the menu line where the cursor is placed - Stores the selected values and returns to the SERVICE MENU - Deletes error codes in the MONITOR INFORMATION menu and returns to the SERVICE MENU
▲	Moves the cursor up and returns to the previous menu
▼	Moves the cursor down and selects a sub menu in special occasions
◀ ▶	Selects new values in the menus and selects a sub menu in special occasions

Stand (Only TV's with motorised stand)

To be adjusted when the gear box with the motor stand control has been mounted in the TV, or if any part of the electrical chassis that contains PCB6 with the EEPROM 6IC6 has been replaced.

- Enter Service Mode and select the STAND line.
- Press **GO**, when CALIBRATION OK is displayed the centre position of the motorized stand has been found.

Focus

- To get access to the FOCUS potentiometer in the EHT transformer, pull out the main chassis.
- Adjust to optimum focusing of the vertical lines as viewed approx. 10cm/4" from the edge of the screen by means of the FOCUS potentiometer in the EHT transformer (see ➤3).

Picture adjustments

Picture adjustments shall only be done in format 1 (4:3) and must be done in a dark room.

- Select PICTURE in the OPTIONS menu and set the values for BRIGHTNESS, CONTRAST and COLOUR to the mid position. Press **GO** to store.
- Enter Service Mode and select the MONITOR line.
- Select the PICTURE ADJUSTMENTS line.
- Check that BRIGHTNESS, CONTRAST and COLOUR in CURRENT VALUES must show 32.

Some of the adjustments are fixed and should not be adjusted:

- OFFSETS REGULATIONS:

BRIGHTNESS	19
CONTRAST	25
COLOUR	7
SOFT CLIP	0
PWL	10

- Adjust R-DR, G-DR and B-DR to correct white level.
- Adjust BLACK OFFSET R and BLACK OFFSET G to correct grey level.

G2 Adjustment (see ➤3).

H-CENTER in GEOMETRY ADJUSTMENTS must be made before G2 adjustment.

- To get access to the SCREEN potentiometer in the EHT transformer, pull out the main chassis.
- Select the G2 ADJUSTMENT line in the PICTURE ADJUSTMENTS menu by pressing ►►. The screen now turns black. Adjust by means of the SCREEN potentiometer in the EHT transformer until the Stand By LED turns green (red = G2 too high, yellow = G2 too low, green = G2 ok). Then press **GO** to return to the PICTURE ADJUSTMENTS menu.

Geometry adjustments

Geometry adjustments have to be done in format 1 (4:3) and format 2 (16:9).

- Enter Service Mode select MONITOR and select GEOMETRY ADJUSTMENTS.

Some of the adjustments are fixed and should not be adjusted:

Vertical S-Correction (V-SC)	35 Format 1	32 Format 2
Horizontal sensitivity (EHT)	0 Format 1 & 2	
Vertical Zoom (V-ZO)	25 Format 1 & 2	
Vertical Scroll (VSCR)	31 Format 1 & 2	
Vertical Wait (V-WA)	15 Format 1 & 2	

The adjustments must be done first in format 1 (4:3).

- Press **V.TAPE** to get a black picture.
- To get access to the SCREEN potentiometer in the EHT transformer, pull out the main chassis.
- Adjust the SCREEN potentiometer in the EHT transformer until the picture turns grey.
- Enter Service Mode and select the MONITOR line.
- Select the GEOMETRY ADJUSTMENTS line.
- Place the cursor on a line by means of ▲ and ▼ Press **GO** to select the line. Now a small menu appears on the screen. It is possible to switch between the small menus by means of ▲ and ▼ buttons.
- Select the H-AM (Horizontal AMplitude) line and adjust until the picture is inside the phosphor edge in both sides of the picture. Select the H-CENTER (Horizontal Centering) line and adjust until the grey picture is just outside the phosphor edge in the right hand side of the picture and 7mm inside the picture in the left hand side.

Select the H-AM line and adjust to correct picture width.

- Make the G2 adjustment as described in PICTURE ADJUSTMENTS.

Vertical Shift (V-SH)

- Set BLANKING to 1. Adjust V-SH until the blanking is at the vertical centre of the screen (i.e. 205mm from the top of the picture). Set BLANKING to 0.

Vertical Amplitude (V-AM)

- Adjust V-AM so that the picture fits at the top (i.e. 12mm from the top of the picture to the top of the circle).

Vertical Slope (V-SL)

- Adjust V-SL so that the picture fits at the bottom (i.e. 12mm from the bottom of the picture to the bottom of the circle).

Horizontal Phase (H-PH)

- Adjust H-PH to the correct centering of the picture.

Horizontal Amplitude (H-AM)

- Adjust H-AM to the correct width of the picture.

East/West Parabola (EW-P)

- Adjust EW-P to the correct geometry at the sides. The middle part of the vertical lines must be as straight as possible.

East/West Upper Corner (EWUC)

- Adjust EWUC to the correct geometry at the upper corners.

East/West Lower Corner (EWLC)

- Adjust EWLC to the correct geometry at the lower corners.

East/West Trapezium (EW-T)

- Adjust EW-T to the correct geometry.

Horizontal PARallelogram (H-PA)

- Adjust H-PA to the correct geometry.

Horizontal BOW (BOW)

- Adjust BOW until the vertical line at the center of the picture is straight.

It may be necessary to repeat some of the adjustments.

- Write down the values for H-PH, EWLC, BOW, H-CT and V-SH.
- Press **GO** to store the adjustments.

Exit Service Mode.

Geometry adjustments in format 2 (16:9)

Only the adjustments mentioned has to be done.

- Switch the TV ON.
 - Toggle on **LIST** until the Beo4 display shows FORMAT, then press **GO** and **2** to select FORMAT 2.
 - Enter Service Mode and select the MONITOR line.
 - Select the GEOMETRY ADJUSTMENTS line.
- When selecting an adjustment item the picture must change to 16:9.
- Adjust H-PH, EWLC, BOW, H-CT and V-SH to the values from format 1 and check the fixed values for format 2, see previous page.

Vertical Amplitude (V-AM)

- Adjust V-AM so that the picture fits at the top (i.e. 12mm from the top of the picture to the top of the circle).

Vertical Slope (V-SL)

- Adjust V-SL until there is 105mm from the bottom of the circle to the bottom of the visible screen.

Horizontal Amplitude (H-AM)

- Adjust H-AM to the correct width of the picture.

Horizontal Phase (H-PH)

- Adjust H-PH to the correct centering of the picture.

East/West Parabola (EW-P)

- Adjust EW-P to the correct geometry at the sides. The middle part of the vertical lines must be as straight as possible.

East/West Upper Corner (EWUC)

- Adjust EWUC to the correct geometry at the upper corners.

East/West Trapezium (EW-T)

- Adjust EW-T to the correct geometry.

Horizontal PARAllelogram (H-PA)

- Adjust H-PA to the correct geometry.

It may be necessary to repeat some of the adjustments.

- Press **GO** to store the adjustments.

Exit Service Mode.

Adjust Tuner takeover, IF adjust and FM sound adjust

- The values (A) written on the label placed on PCB1, have to be written into the EEPROM (6IC6) (see ➤4).
- Enter SETUP, select SERVICEMODE with **0, 0, GO**. Press the button combination within 3 seconds. Highlight TV-TUNER, select with **GO**. Change the settings by means of **◀** and **▶** until they match the values on the label. Then press **GO** to store the settings.

Exit Service Mode.

Finish the on-site service

- If a non-customer VTR has been used V.TAPE must be set to NONE. Select OPTIONS in SETUP. Select CONNECTIONS and set V.TAPE to NONE. Press **GO** to exit SETUP.
- See #7 *Check after replacement of main chassis or modules*, for finishing the on-site service.

#7 Check after replacement of main chassis or modules**Disconnect the ESD mat from the main chassis**

- Remove the alligator clip from the aerial input on the main chassis.

Mount back cover

- The back cover can now be mounted. Fasten the screws (Please see 9.1 *Service mode 1*).
- Place the TV in its original stand and place and connect all the cables.

Picture

- Check that picture on all internal and external sources works correctly.
- Check if teletext works correctly.
- Check geometry of both format 4:3 and format 16:9. Adjust if necessary.

Sound

- Check that sound on all sources works correctly. Remember satellite and videotaperecorder, if these are present.

Other

- If a videotaperecorder is connected to the TV, check whether the record and playback functions work correctly.
- If the TV is mounted with a motor stand, this should be calibrated. Enter SETUP, select SERVICEMODE with **0, 0, GO**. Press the button combination within 3 seconds. Select STAND with **GO**. Press **GO** to calibrate the television. When done and CALIBRATION OK is displayed, press **GO** to exit. Then check if the stand works correctly.

Check that the surfaces of the TV are clean, if not they should be cleaned

- See #5 *Removal of the contrast screen and cleaning the television* for more information.

#8 Service Mode

Reading the error code

To read an error code from the television you must access the Service Mode. Then select **MONITOR -> MONITOR INFORMATION**. If the television has registered an error, the error code will be shown in this menu under **ERROR**.

Access to Service Mode

Select **TV SETUP** menu

Beo4: Press **0 0 GO** within 3 seconds

SERVICE MENU

The **STAND** line is only shown if the TV is fitted with motorized stand. The function is described in the section on adjustments.

MONITOR SERVICE MENU

The **PICTURE ADJUSTMENTS** and **GEOMETRY ADJUSTMENTS** lines are described in the section on adjustments.

MONITOR INFORMATION

- Software version numbers
The "STB SW 1.0" line is only shown if the M2 Processor, 11C200 SDA6000, is fitted with set top box controller software.
The "STB TABLE 1.0" line shows the version of conversion of set top box remote control codes into Beo4 codes.
- Type, item and serial numbers
- Theft protection status. Shows if the Master code is correctly entered (STORED/ NOT STORED)
- Option programming
- Latest five TV errors
- Latest ML error
- Latest AVL error from the V.TAPE and AV sockets

OPTION SETTING

Option 0 = The IR receiver of the TV is disconnected.

Option 1 = The TV and the Audio system (BeoLink system) are placed in the same room.

Option 2 = The TV and the Audio system (BeoLink system) are placed in different rooms.

Option 5 = The TV and the Audio system (BeoLink system) are placed in the same link room.

Option 6 = The TV is the only product in the link room.

ERROR:TV

The TV is able to detect certain types of error and display them on the screen. The five latest TV errors are shown as error codes and displayed with the month/date (four digits) as provided by the system clock. The most recent error is displayed at the top. As the TV has no hardware clock the displayed month/date will not be correct, but can be used to see if more errors have occurred at the same date.

The following TV error types can be displayed:

. . . . No error registered
 DF Data failure
 POR1 Power on reset failure 1
 POR2 Power on reset failure 2
 PDD Power down detected failure

ML error codes are for detection of errors in the Master Link system.

. . . . No error registered
 CI Address configuration impossible
 TD ML data pulled down
 TU ML data pulled up
 ?? Other undefinable error possibilities
 NH No Hardware. There is no Master Link PCB in the TV

AVL error codes from the V.TAPE and AV sockets

. . . . No error registered
 TI Transmission impossible
 TD Data link tied down

Motorized stand error codes

ST-01 Calibration error too few positions
 ST-02 Calibration error too many positions
 ST-03 Calibration error EEPROM
 ST-04 Calibration error transducer
 ST-05 Calibration error position

After repair of an error that has triggered the display of an error code, the error code has to be deleted. This is done by pressing **GO** in the MONITOR INFORMATION menu.

IIC bus error

An IIC bus error means that the communication on the bus fails when the microcomputer tries to communicate with the address in question.

Module no.	Error Code
1	8A
1	C0
1	A2
1	22
64	80
1	80
63	C8
1	8C
1	40
6	60
32	84

Data failure (DF)

If an error occurs in the EEPROM (61C6) that prevents output of geometry data to the TV set, the microcomputer will replace the missing data with default data stored in the EPROM (61C3) module 999.

Power on reset failure 1 (POR1)

Reset or update failure of 1IC100 (TDA9321H module 999) during start up.

Power on reset failure 2 (POR2)

Reset or update failure of 1IC350 (TDA9330H module 999) during start up.

Power down detected failure (PDD)

Power down failure detected on 1IC300 (TDA9178 module 999).

Address configuration impossible (CI)

Error during address configuration. No address has been allocated because an excessive number of units has been connected to the Master Link.

- Disconnect all units from the link and reconnect them again one at a time.

ML data pulled down (TD)

The link is pulled down (Low). This error can occur in the form of a physical short circuit in the link. In the link drivers, or in the ML master/source circuit module 51 in the TV.

ML data pulled up (TU)

The link is pulled up (High). This error can occur in the form of a physical short circuit in the link. In the link drivers, or in the ML master/source circuit module 51 in the TV.

Transmission impossible (TI)

It is not possible to send data to pin 8 on the V.TAPE or AV socket, probably because of noise.

Data link tied down (TD)

The data link connection to pin 8 on the V.TAPE or AV socket is short circuited to ground.

Calibration error too few positions (ST-01)

Not enough positions are read during Stand calibration. The Stand may be blocked.

Calibration error too many positions (ST-02)

Too many positions are read during Stand calibration.

Calibration error EEPROM (ST-03)

Failure when the Stand offset should be stored in the EEPROM.

Calibration error transducer (ST-04)

An invalid position is read from the transducer.

Calibration error position (ST-05)

Several readings from the transducer with the Stand in the same position.

Flash-programming of the M2 processor

It is not possible to built-in a Set-top-Box Controller module in the chassis.

The Set-top-Box Controller is software which has to be flash-programmed into the M2 processor.

For this purpose Bang & Olufsen has developed a "Flash Tool" which is a PC/LapTop application for installation/updating the STB-C software.

Tools needed for flash-programming

- PC/LapTop with Bang & Olufsen "Flash Tool" application (can be downloaded from the Retail System).
- Cable kit no. 3375397.

Flash-programming

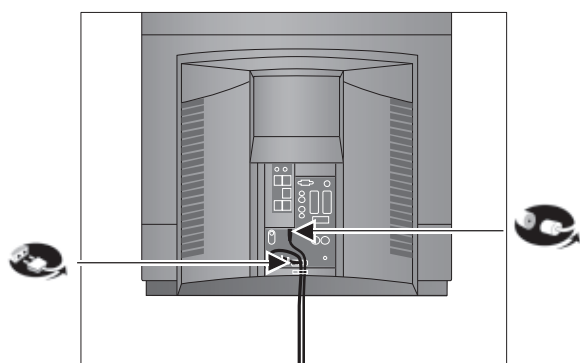
Installation/Updating STB-C software

- Start the "Flash Tool" and follow the on-screen instruction on the PC.

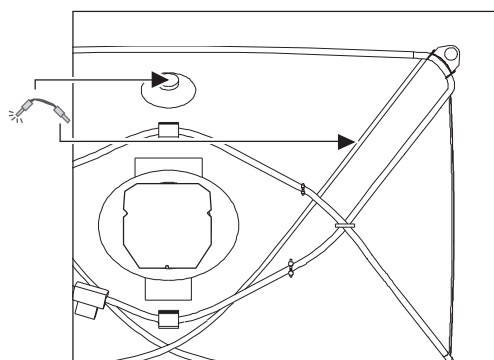
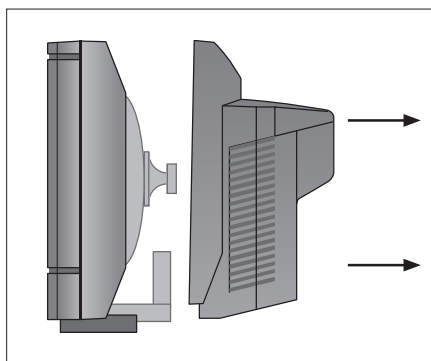
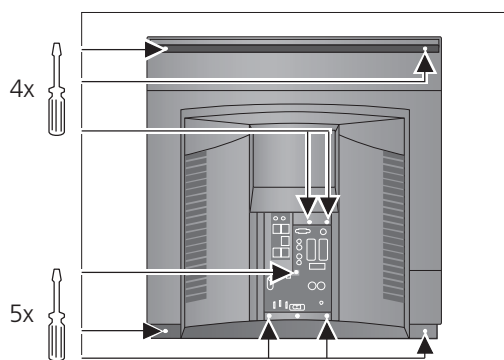
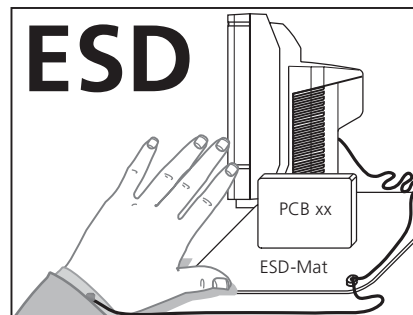
Note!

Software versions can be checked in the "Service Menu".

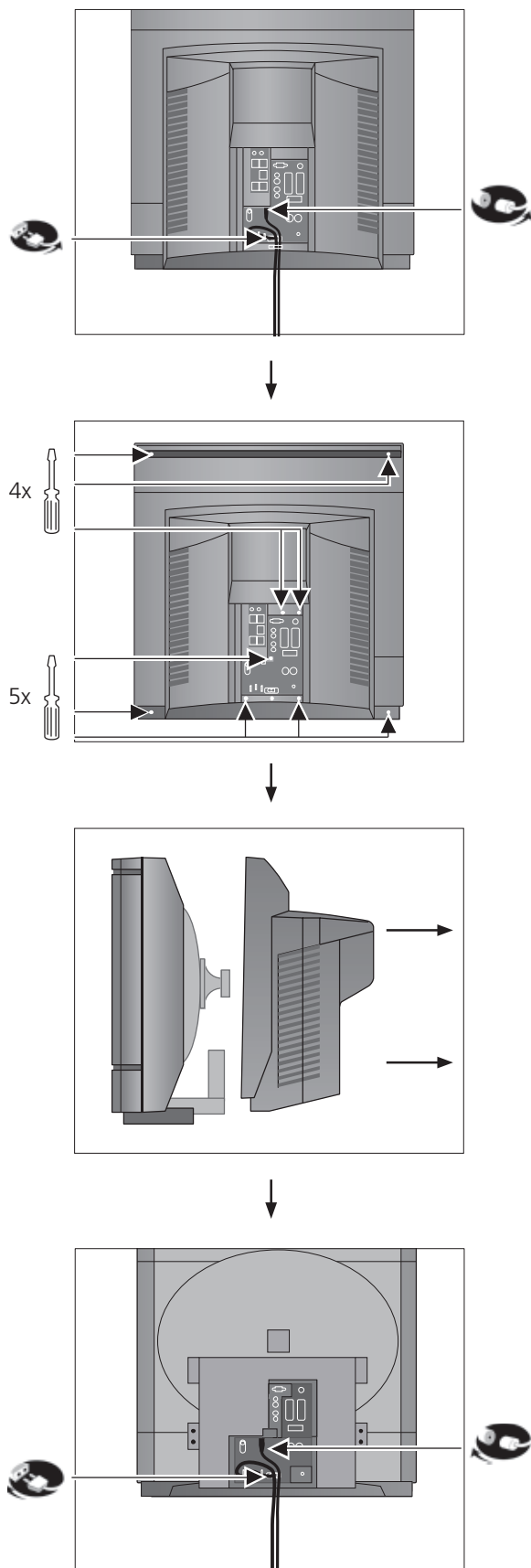
Service mode 1



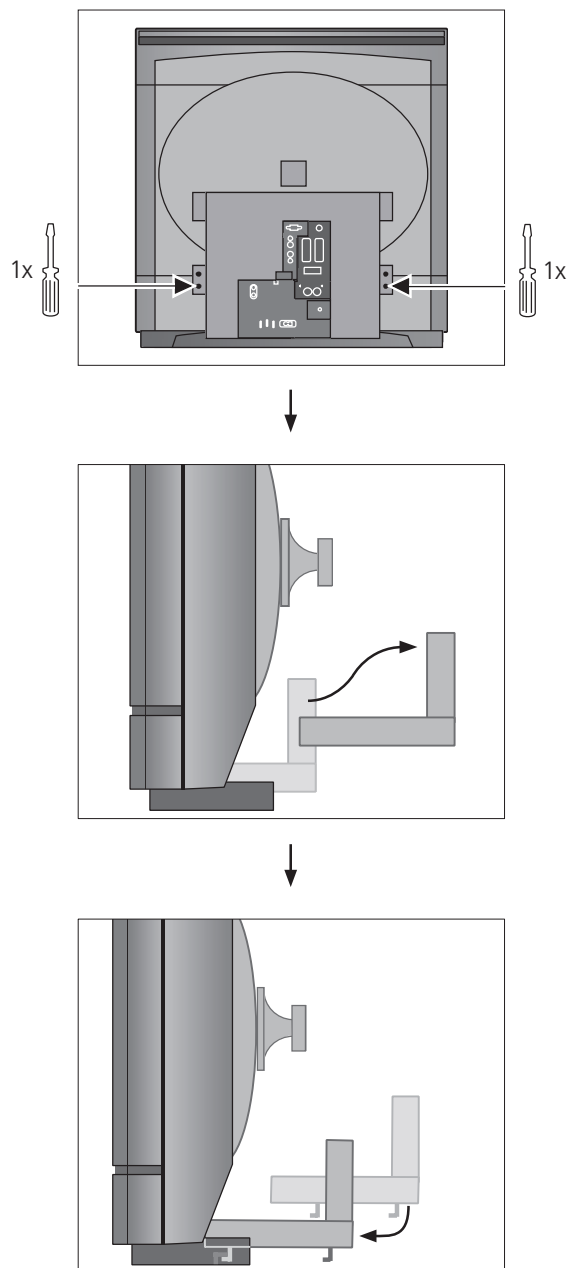
Attention!



Service mode 2

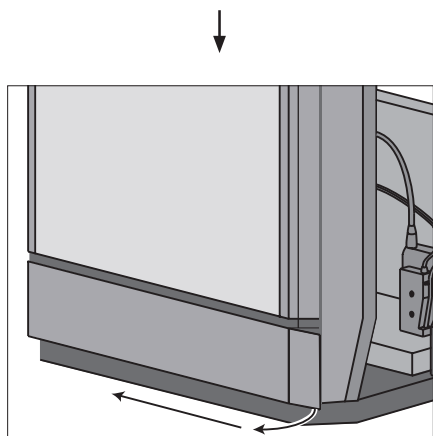
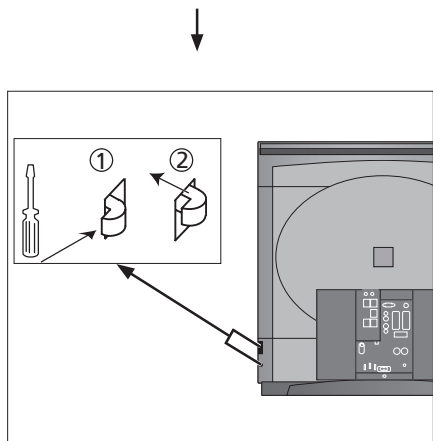


Main chassis in service position

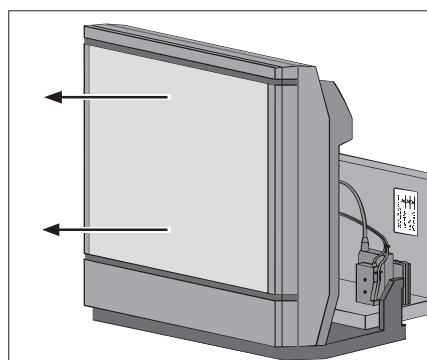
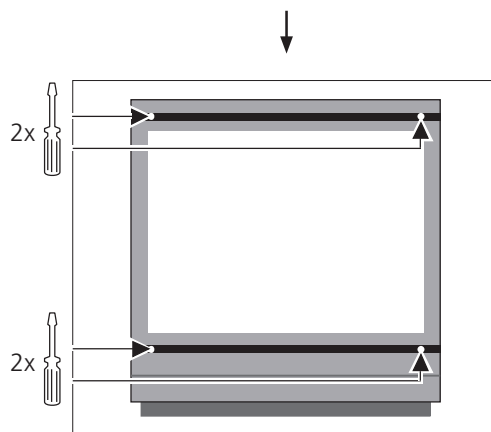
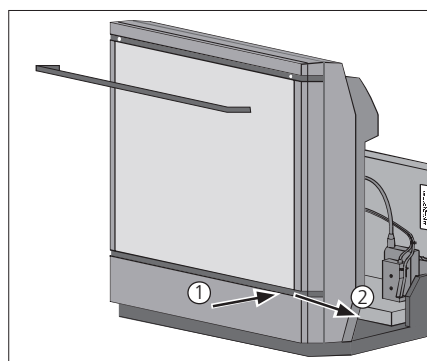
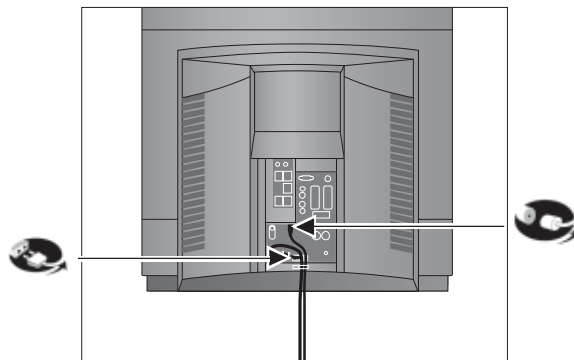


➤1

➔ 9.1 Service mode 1



➤2

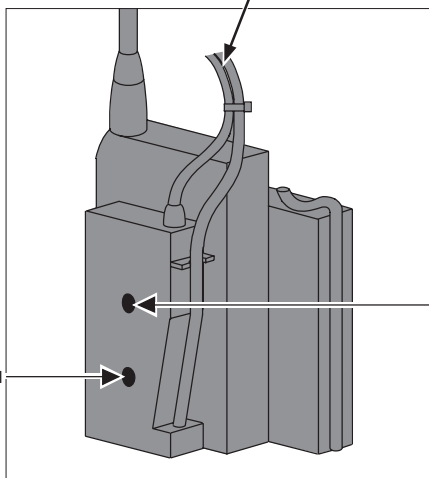
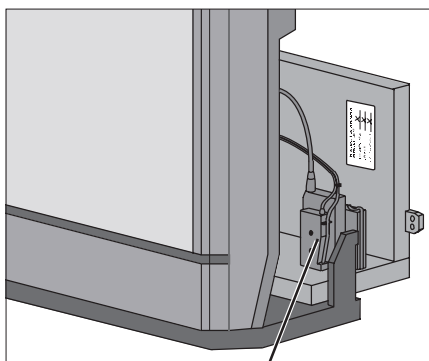


➤3

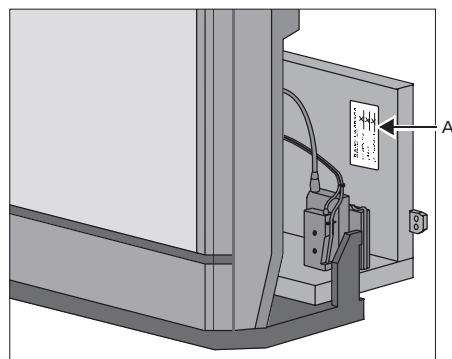
➔ 9.2 Service mode 2

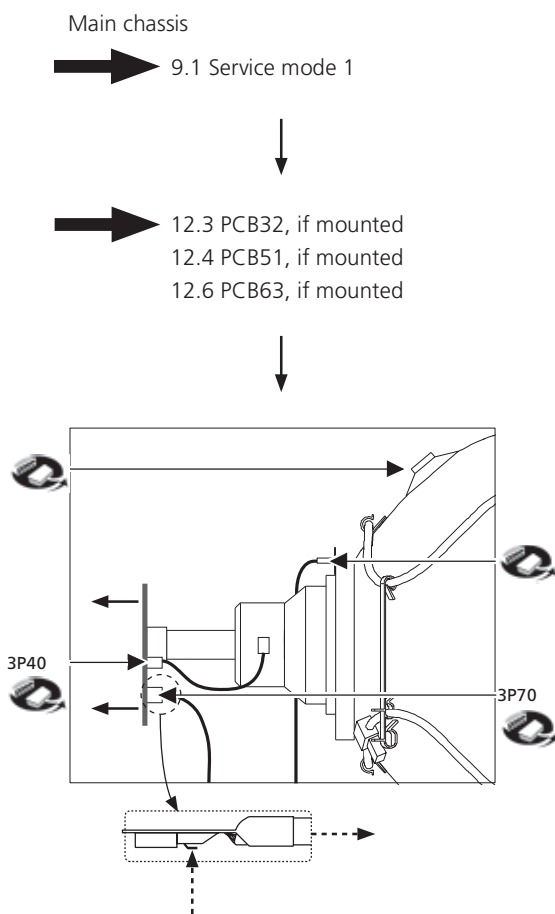


➔ 9.3 Main chassis in service position

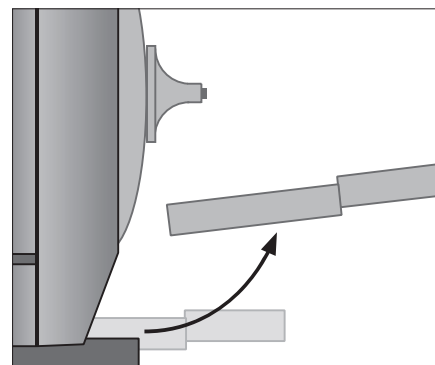
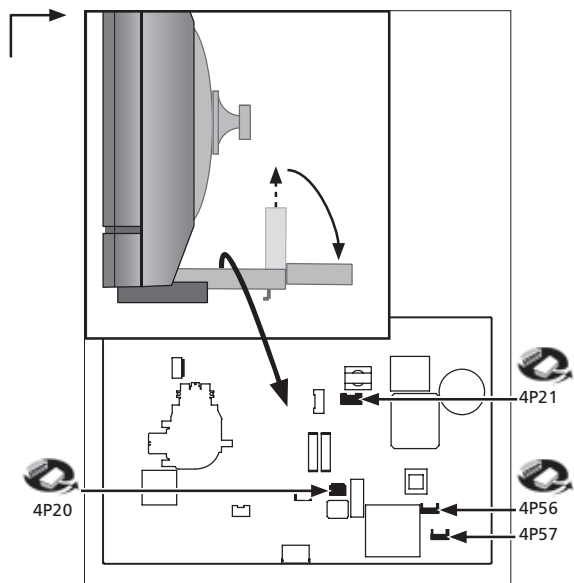
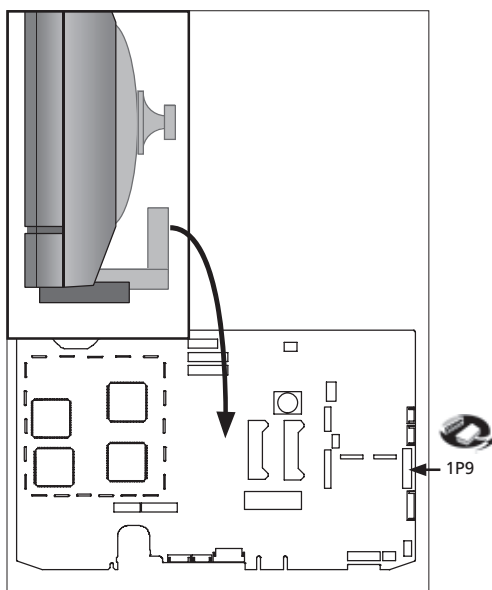


➤4





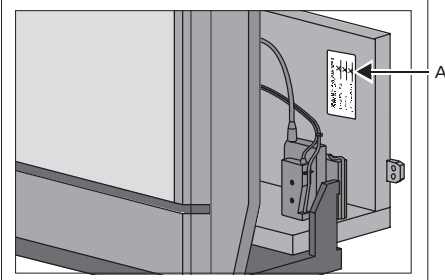
➔ 9.3 Main chassis in service position



Please note: transfer 6IC6 & values label A

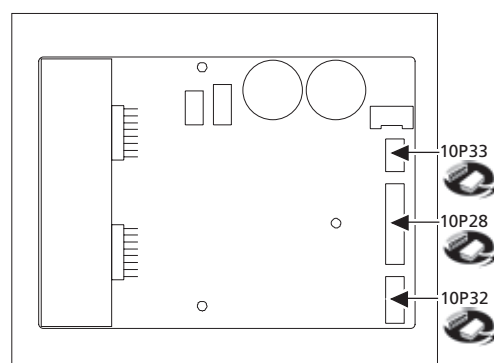
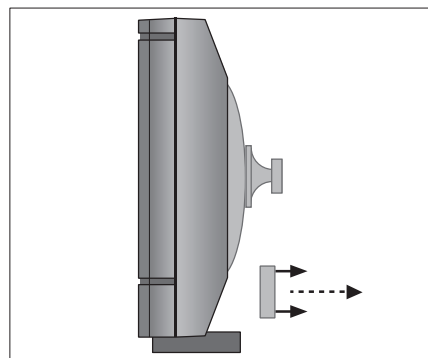
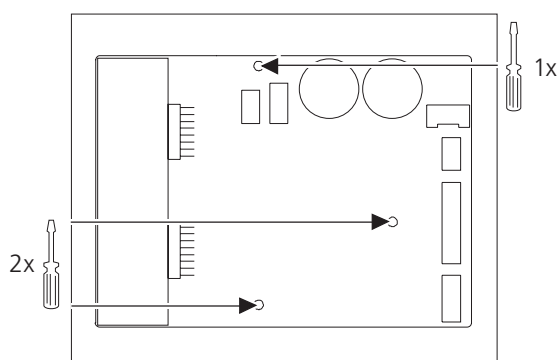
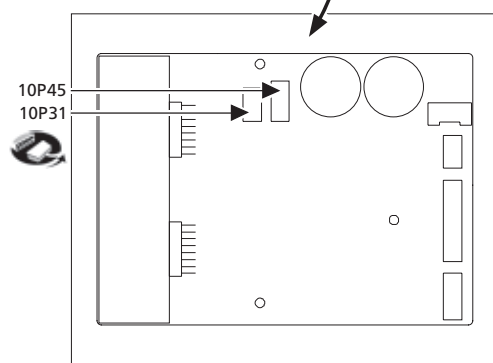
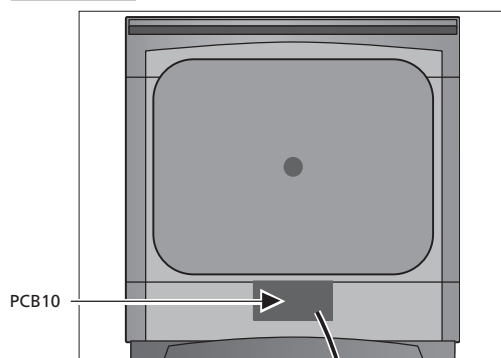


Replace using IC-pliers (part no. 3629145)

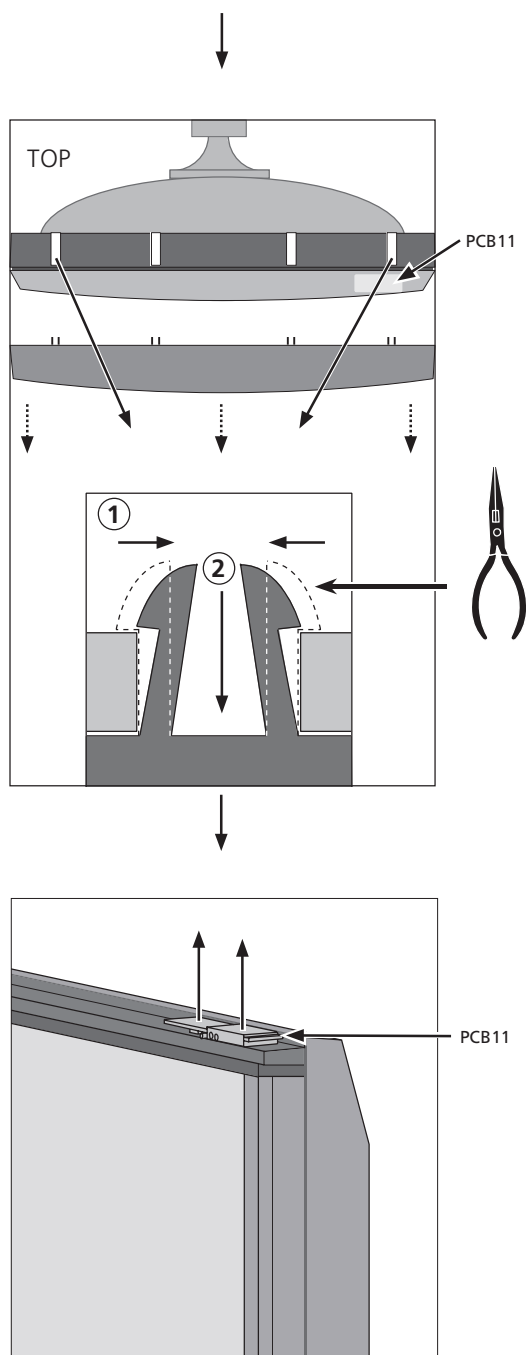


PCB10, Sound Output module

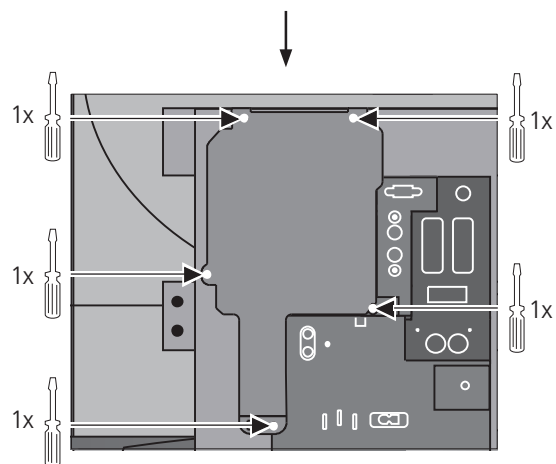
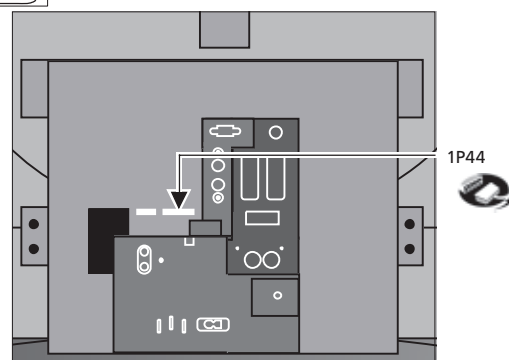
➔ 11.1 Replacement of Main chassis



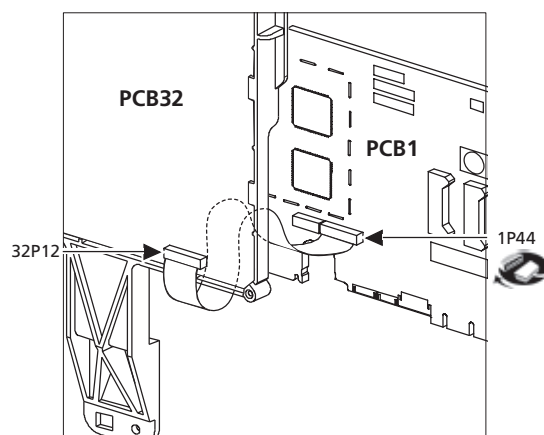
PCB11, IR receiver module

 9.1 Service mode 1

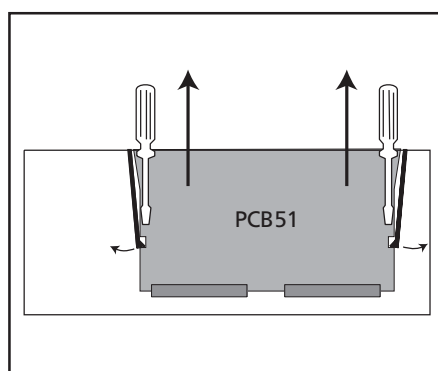
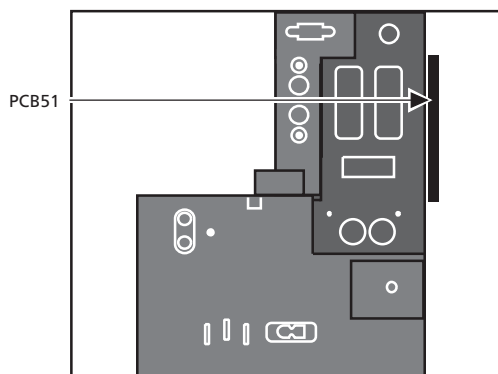
PCB32, AC3 module

 9.1 Service mode 1**Attention!**

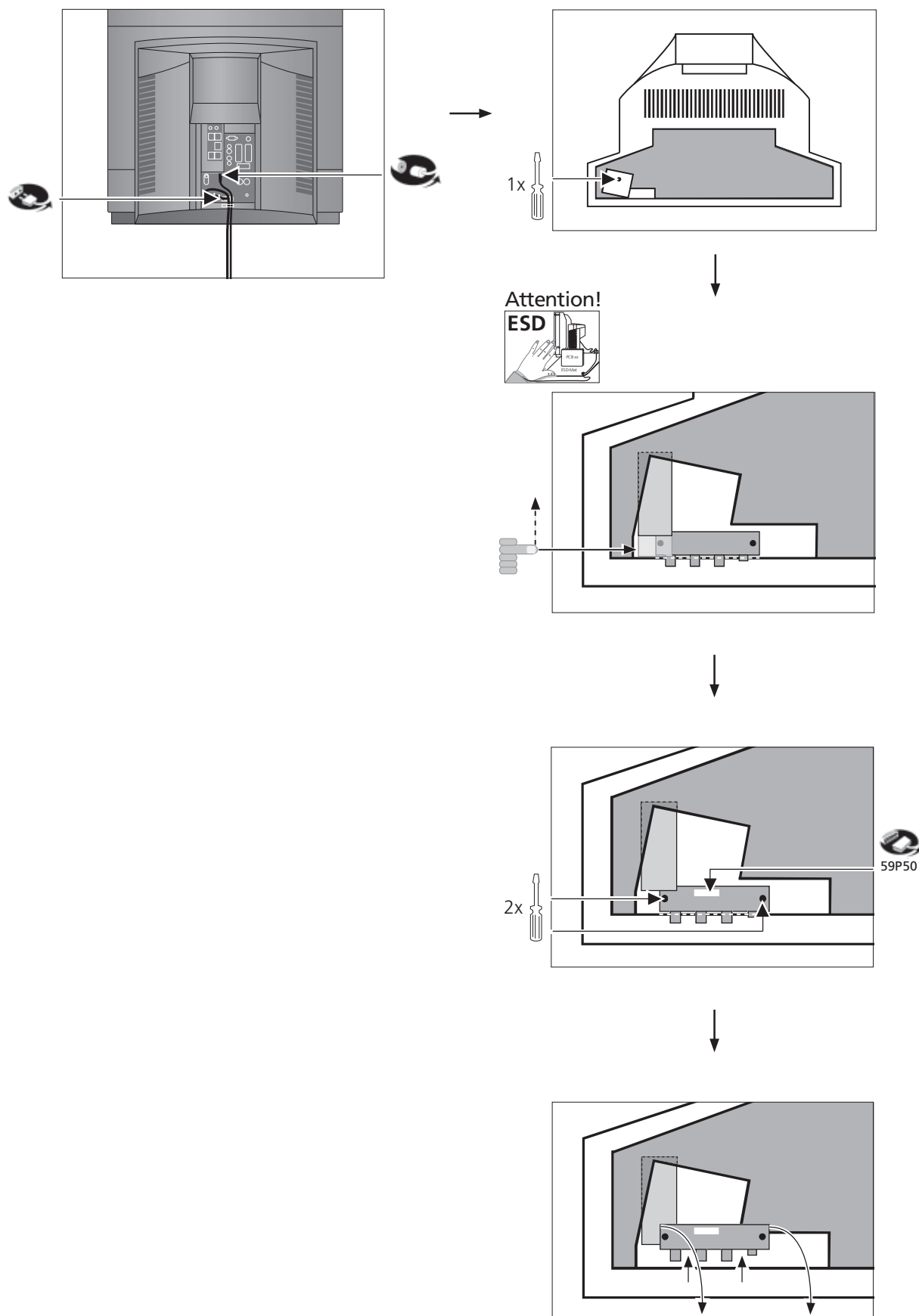
Remounting cable!



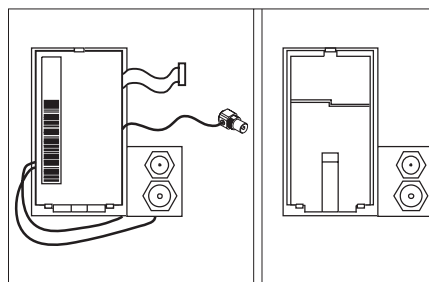
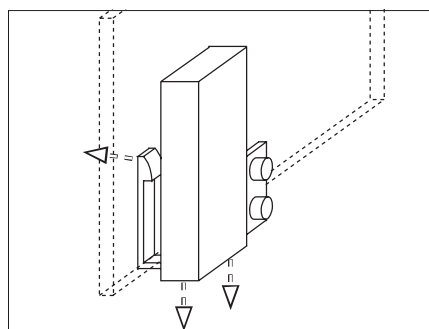
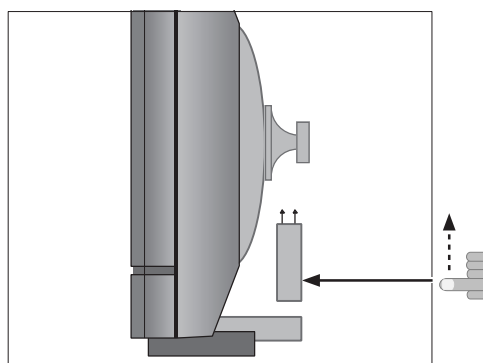
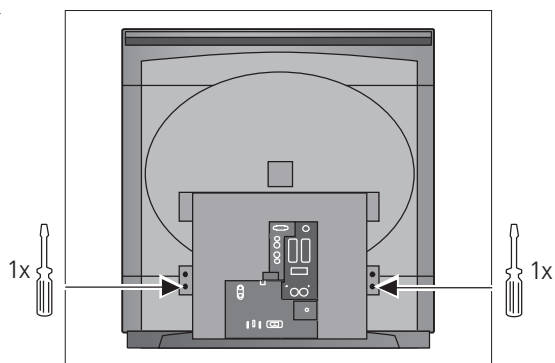
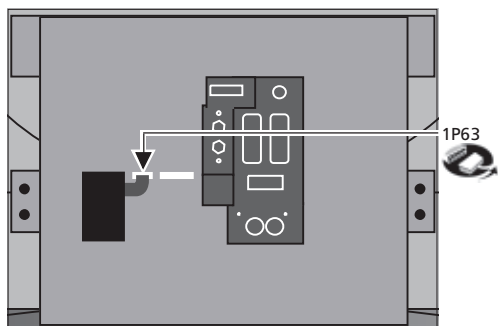
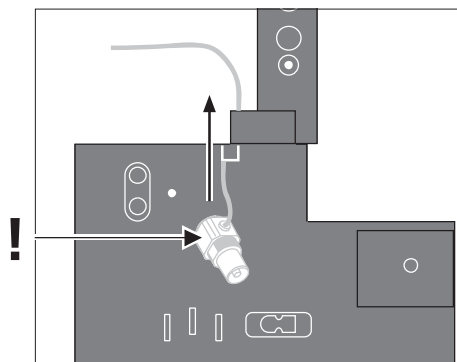
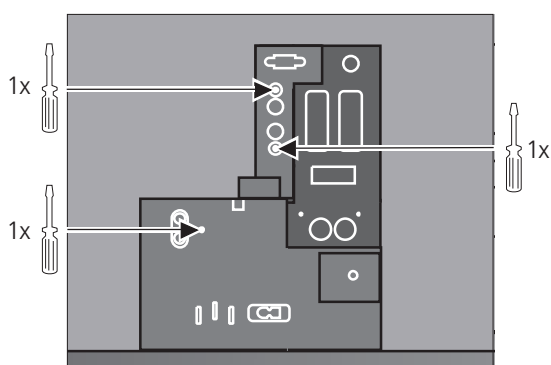
PCB51, Masterlink module

 9.1 Service mode 1

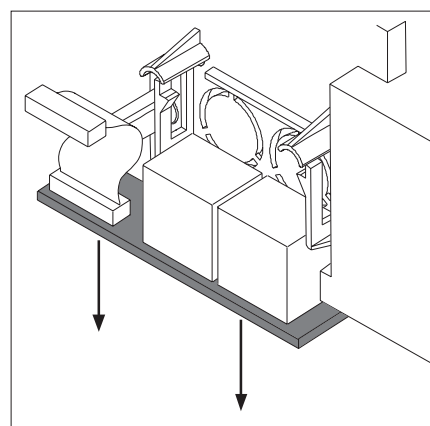
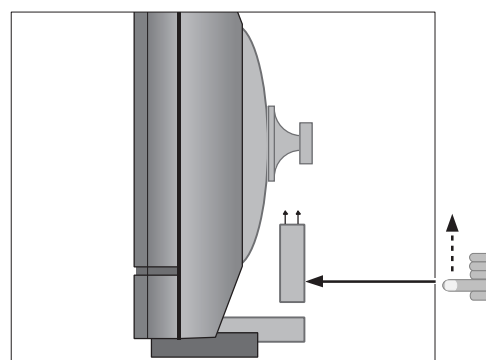
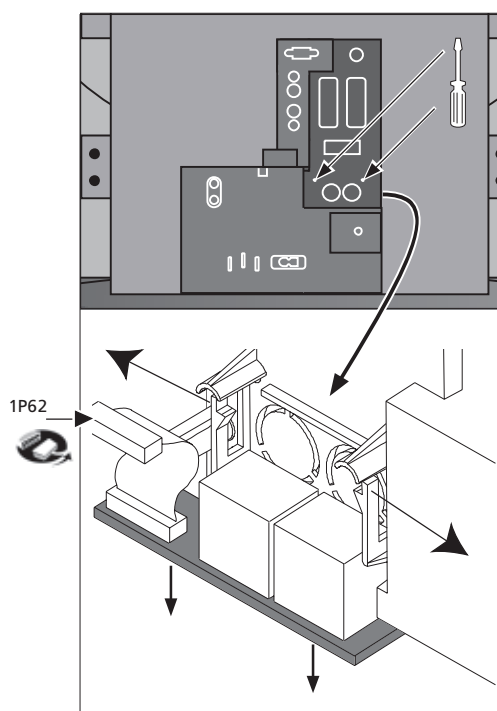
PCB59, Camcorder interface module



PCB63, Modulator module

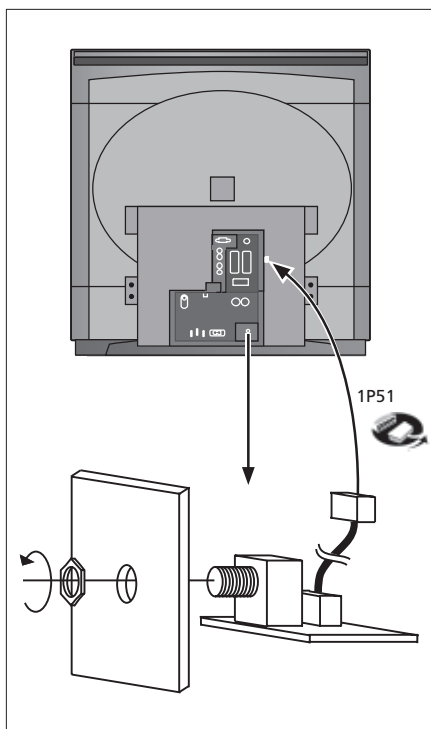
 9.1 Service mode 1 12.3 PCB32, if mounted

PCB64, Powerlink module

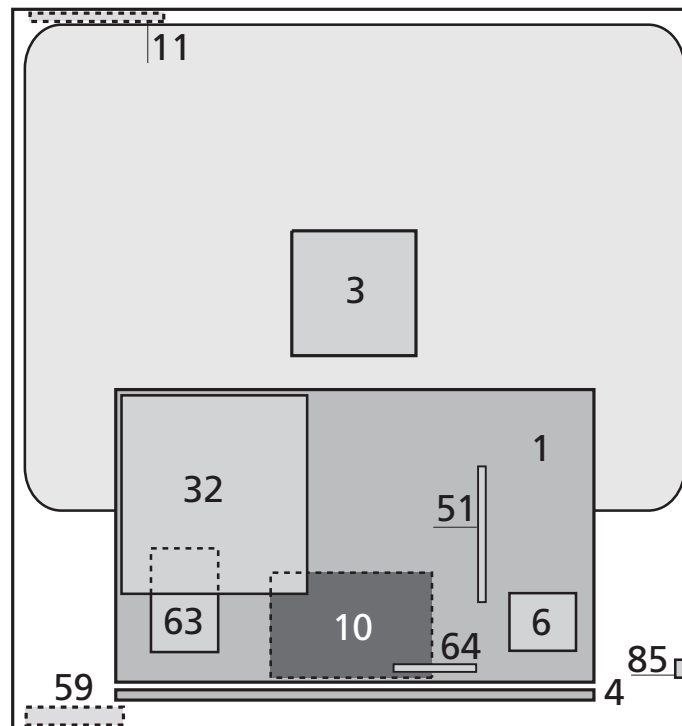
 9.1 Service mode 1 9.3 Main chassis in service position

PCB85, Mini jack f. STB-Controller

➔ 9.1 Service mode 1



Survey of modules



PCB1, PCB3, PCB4, PCB6, PCB64	Main chassis modules, module 999
PCB10	Sound output module
PCB11	IR Receiver module
PCB32	Dolby Digital Decoder (AC3)
PCB51	Masterlink module
PCB59	Camcorder interface module
PCB63	Splitter & Modulator module
PCB85	Mini jack f. STB-Controller